

Application No. 10/652,483  
Response to 10/18/2006 Office Action

## AMENDMENTS TO THE CLAIMS

The following claims replace all prior versions and listings of claims in the application:

1. (cancelled)
2. (previously cancelled)
3. (Currently Amended) [The method of claim 1,] A method for defining tone signals in a voice activity detection (VAD) device, comprising:

defining a threshold for zero amplitude change by determining, for a signal with a zero value amplitude at a zero crossing point, a tangent value of the signal, and by defining the zero value amplitude as a non-zero value depending upon the tangent of said signal at the zero crossing point;

calculating a zero crossing rate of a signal;

extracting a set of parameters from a plurality of duration periods of said signal;

calculating a maximum difference between said plurality of duration periods; and

comparing said maximum difference with said threshold; and

declaring a sample of the signal as containing a tone when the maximum difference is not greater than the threshold;

wherein said defining comprises defining the threshold as one if the signal has no zero amplitude change, and defining the threshold as two if the signal has a zero amplitude change.

Claims 4-8 cancelled.

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9. (withdrawn)

10. (cancelled)

11. (withdrawn)

12. (cancelled)

13. (withdrawn)

14. (cancelled)

15. (withdrawn)

16. (cancelled)

17. (Currently Amended) [The method of claim 1,] A method for defining tone

signals in a voice activity detection (VAD) device, comprising:

defining a threshold for zero amplitude change by determining, for a signal with a  
zero value amplitude at a zero crossing point, a tangent value of the signal, and by  
defining the zero value amplitude as a non-zero value depending upon the tangent of  
said signal at the zero crossing point;

calculating a zero crossing rate of a signal;

extracting a set of parameters from a plurality of duration periods of said signal;

calculating a maximum difference between said plurality of duration periods; and

comparing said maximum difference with said threshold; and

declaring a sample of the signal as containing a tone when the maximum  
difference is not greater than the threshold;

wherein the calculating the zero crossing rate comprises:

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analyzing the sample to determine if an amplitude of a signal sample is zero at a zero crossing point;

when the amplitude is zero at the zero crossing point, determining a tangent of a signal wave of the signal sample at the zero crossing point;

changing the signal amplitude from zero to negative one if the tangent is negative; and

changing the signal amplitude from zero to positive one if the tangent is positive.

18. (cancelled)

19. (cancelled)

20. (Currently Amended) [The method of claim 4, further comprising:] A device for defining tone signals for voice activity detection (VAD), comprising:

a processor that is programmed to:

define a threshold for zero amplitude change;

calculate a zero crossing rate of a signal;

extract a set of parameters from a plurality of duration periods of said signal;

calculate a maximum difference between said plurality of duration periods; and

compare said maximum difference with said threshold

calculating a zero crossing rate wherein the signal has a zero amplitude change at a zero crossing by:

analyzing the sample to determine if an amplitude of a signal sample is zero at a zero crossing point;

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when the amplitude is zero at the zero crossing point, determining a tangent of a signal wave of the signal sample at the zero crossing point;  
changing the signal amplitude from zero to negative one if the tangent is negative; and  
changing the signal amplitude from zero to positive one if the tangent is positive.